1-1-1965

Test 886: Allis-Chalmers 190 (Diesel)

Tractor Museum
University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

NEBRASKA TRACTOR TEST 886 - ALLIS-CHALMERS ONE-NINETY DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours								
* 77.20	2200	5.389	0.483	14.33	189	60	75	29.070
Standard Power Take-off Speed (540 rpm)—One Hour								
72.33	1937	4.962	0.475	14.58	194	59	75	29.050
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS								
69.00	2311	4.769	0.478	14.47	180	59	74	.....
0.00	2430	1.669	.....	.....	170	59	74	.....
35.49	2377	3.061	0.597	11.59	174	59	76	.....
77.50	2200	5.397	0.482	14.36	188	59	76	.....
17.89	2408	2.319	0.897	7.71	172	59	74	.....
52.40	2344	3.915	0.517	13.38	176	59	75	.....
Av 42.05	**2345**	**3.522**	**0.580**	**11.94**	**177**	**59**	**75**	**29.060**

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cooling med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—4th Gear											
65.33	5714	4.29	2203	7.72	5.342	0.566	12.23	181	50	55	28.975
75% of Pull at Maximum Power—Ten Hours—4th Gear											
52.52	4278	4.60	2314	5.57	4.477	0.590	11.73	179	55	59	28.693
50% of Pull at Maximum Power—Two Hours—4th Gear											
37.51	2937	4.79	2352	3.39	3.562	0.657	10.53	178	55	67	28.585
MAXIMUM POWER WITH BALLAST											
61.74	8663	2.67	2224	14.56	2nd Gear			182	55	67	28.560
64.03	7165	3.35	2202	10.74	3rd Gear			181	46	52	29.120
65.41	5732	4.28	2201	7.65	4th Gear			180	48	56	29.100
66.59	5034	4.96	2197	6.76	5th Gear			180	47	54	29.120
67.18	4046	6.23	2199	5.36	6th Gear			180	47	54	29.100
66.08	2558	9.69	2201	3.54	7th Gear			180	48	55	29.100
63.25	1701	13.94	2199	2.27	8th Gear			180	48	54	29.100
MAXIMUM POWER WITHOUT BALLAST											
55.63	4994	4.18	2275	14.54	4th Gear			178	59	77	28.650

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—4th Gear							
Pounds pull	5732	6106	6369	6463	6447	6375	6086
Horsepower	65.41	62.39	57.34	50.92	43.51	35.80	27.44
Crankshaft speed, rpm	2201	1987	1758	1543	1322	1098	878
Miles per hour	4.28	3.83	3.38	2.95	2.53	2.11	1.69
Slip of drivers, %	7.65	8.39	8.93	9.06	8.93	9.06	8.53

TIRES, BALLAST and WEIGHT		**With Ballast**	**Without Ballast**
Rear tires	—No, size, ply & psi	Two 18.4-34; 8; 16	Two 18.4-34; 8; 16
Ballast	—Liquid	980 lb each	None
	Cast iron	700 lb each	None
Front tires	—No, size, ply & psi	Two 7.50-16; 6; 28	Two 7.50-16; 6; 28
Ballast	—Liquid	None	None
	Cast iron	None	None
Height of drawbar		20½ inches	21½ inches
Static weight	—Rear	8680 lb	5320 lb
	Front	2400 lb	2350 lb
Total weight with operator		11255 lb	7845 lb

Department of Agricultural Engineering

Dates of Test: APRIL 10 TO APRIL 16, 1965

Manufacturer: ALLIS-CHALMERS MANUFACTURING COMPANY, MILWAUKEE, WISCONSIN

FUEL, OIL and TIME Fuel No. 2 Diesel **Cetane No** 57.0 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8312 **Weight per gallon** 6.920 lb **Oil** SAE 20-20W **API service classificaeion** DS **To motor** 1.921 gal **Drained from motor** 1.357 gal **Transmission and final-drive lubricant** E.P. 80 **Total time engine was operated** 43½ hours.

ENGINE Make Allis-Chalmers Diesel **Type** 6 cylinder vertical **Serial No** 20-01042 **Crankshaft mounted** lengthwise **Rated rpm** 2200 **Bore and stroke** 3⅞" x 4¼" **Compression ratio** 16.25 to 1 **Displacement** 301 cu in **Cranking system** 12 volt electric (two 12-volt batteries) **Lubrication** pressure **Air cleaner** dry type replaceable pleated paper element **Oil filter** full flow replaceable pleated paper cartridge **Fuel filter** two sediment bowls and one dual media replaceable cartridge **Muffler** was used **Cooling medium temperature control** thermostat.

CHASSIS Type standard **Serial No** 190-1041D **Tread width** rear 64" to 80" front 60" to 84" **Wheel base** 105¾" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 31.6" Vertical distance above roadway 39.4" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** Direct engine drive **Tranmission** selective gear fixed ratio with operator controlled partial range power shifting **Advertised speeds mph** first 2.1 second 3.1 third 3.6 fourth 4.4 fifth 5.1 sixth 6.3 seventh 9.6 eighth 13.6 reverse 2.8 and 3.9 **Clutch** single plate dry disc operated by foot pedal **Brakes** contracting band and disc operated by two foot pedals which can be locked **Steering** hydraulic with power assist **Turning radius** (on concrete surface with brake applied) right 133" left 133" (on concrete surface without brake) right 156" left 156" **Turning space diameter** (on concrete surface with brake applied) right 281" left 281" (on concrete surface without brake) right 300" left 300" **Belt pulley** 1845 rpm at 2200 engine rpm diam 9" face 6⁹/₁₆" Belt speed 4347 fpm Power take-off 540 rpm at 1937 engine rpm.

REPAIRS and ADJUSTMENTS No repairs or adjustments.

REMARKS All test results were determined from observed data obtained in accordance with the SAE and ASAE test code.

First gear was not run as it was necessary to limit the pull in second gear to avoid excessive wheel slippage.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 886.

L. F. LARSEN
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
J. J. SULEK
D. E. LANE
Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
E. F. Frolik, Dean; H. H. Kramer, Director, Lincoln, Nebraska

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories can be disconnected only when it is convenient for the operator to do so in practice. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of Automotive Engineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. The tire tread-bar height must be at least 65% of new tread height prior to the maximum power run.

BELT OR POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representaitve makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the belt pulley or the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, ½ the 85% torque; maximum power, ¼ and ¾ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general usage.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests. If the manufacturer specifies a different rated crankshaft speed for drawbar operations, then the position of the manually operated governor control is changed to provide the high-idle speed specified by the manufacturer in the operating instructions.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effect of speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; and (3) 50% of the pull at maximum power. Prior to 1958, fuel consumption data (10 hour test) were shown only for the pull obtained at maximum power for tractors having torque converters and at 75% of the pull obtained at maximum power for gear-type tractors.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 12 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe-limit for the test course. The maximum safe speed for the Nebraska Test Course has been set at 15 miles per hour. The slippage limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Maximum Power Without Ballast. All added ballast is removed from the tractor. The maximum drawbar power of the tractor is determined by the same procedure used for getting maximum power with ballast. The gear (or travel speed) is the same as that used in the 10-hour test.

Varying Power and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions: (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

For additional information about the **Nebraska Tractor Tests** write to the **Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska.**

Allis-Chalmers One-Ninety Diesel